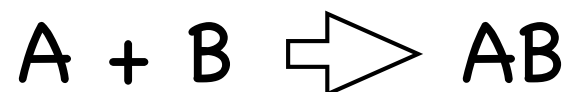
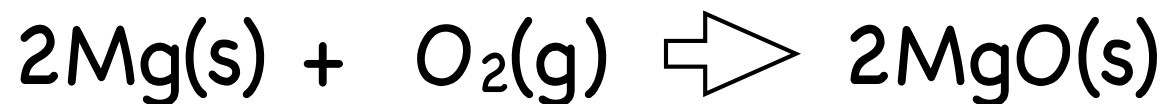


11.2 TYPES OF CHEMICAL REACTIONS

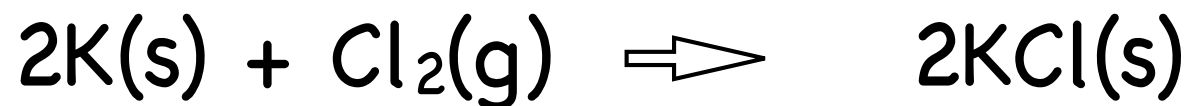
Combination reaction:



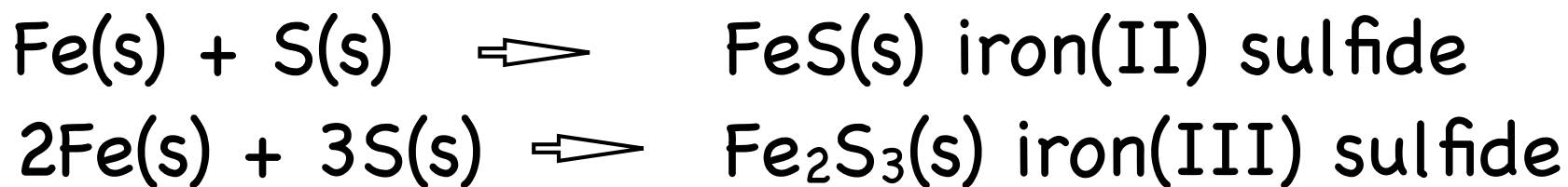
2 or more substances combine to form a single new substance.



If a group A metal and a nonmetal react: a compound consisting of the metal cation and nonmetal anion is produced:



If a transition metal with more than one charge reacts with a nonmetal, more than one product is possible:



Try an example:



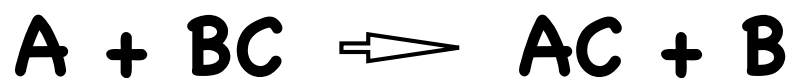
Decomposition reaction: $AB \Rightarrow A + B$

A single compound breaks down into 2 or more simpler products. The products may be elements or compounds.

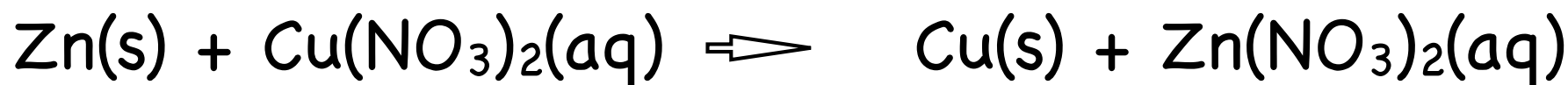


Most decomposition reactions require energy in the form of heat, electricity, or light.

Single-replacement reactions:



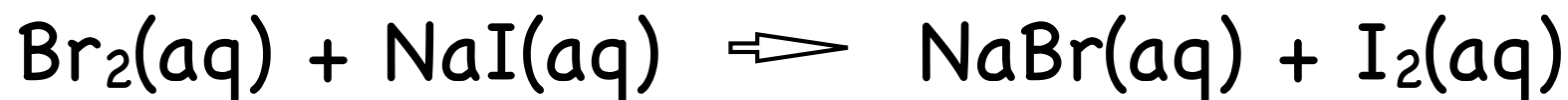
One element replaces a second element in a compound:



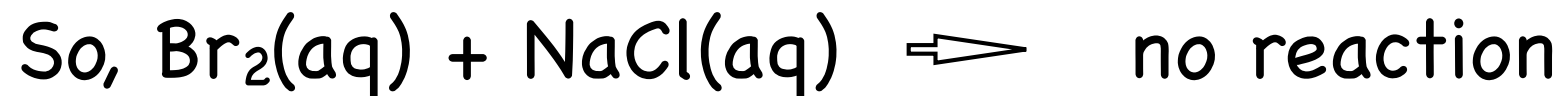
Zinc replaces copper in the above reaction.

Whether one metal replaces another is determined by the activity series of the metals (table 11.2) on p. 333.

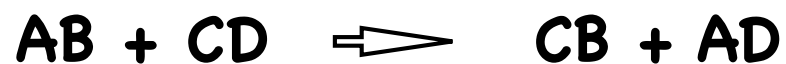
A halogen can also replace another halogen in a compound:



The activity of the halogens decreases as you go down Group VIIA.



Double-replacement reactions:

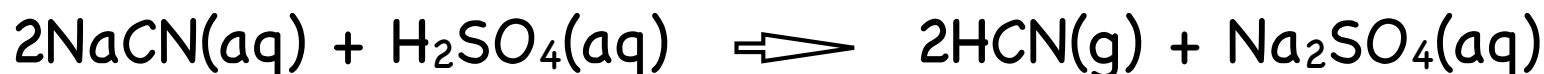


There is an exchange of positive ions (cations) between 2 compounds in solution.

1. One of the products is not soluble and precipitates from solution:



2. One of the products is a gas:



3. One product is a molecular compound such as water:



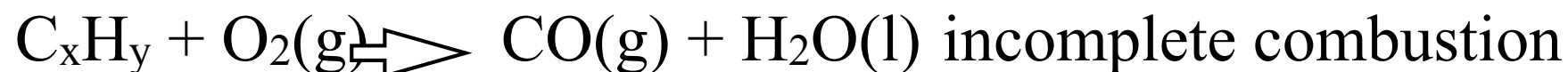
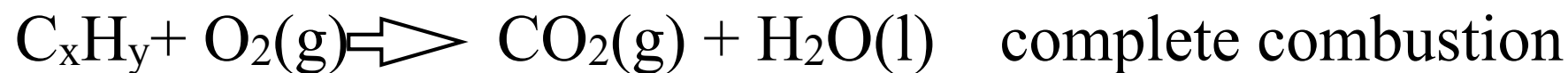
Predicting products of double-replacement reactions:



Combustion reactions:

All involve oxygen as a reactant. Some involve hydrocarbons.

Examples of hydrocarbons are methane (CH₄), propane (C₃H₈), and butane (C₄H₁₀).



Why is an incomplete combustion reaction dangerous?

Some don't involve hydrocarbons:



Predicting combustion products:

